



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,596	12/21/2004	Walter Demuth	016906-0362	2631

22428 7590 06/15/2007
FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007

EXAMINER

DELORM, TATIANA M

ART UNIT	PAPER NUMBER
----------	--------------

3744

MAIL DATE	DELIVERY MODE
-----------	---------------

06/15/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/518,596

Applicant(s)

DEMUTH ET AL.

Examiner

Tatiana Delorm

Art Unit

3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 December 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☒ Claim(s) 1, 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 12/24/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the limitations of Claims 38 and 39 ("air flow paths, air flow control elements, air delivery device, a condenser, a housing for receiving an apparatus for heat exchange, a compressor, an expansion valve and a collector") must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. **Claims 1, 11 is objected** to because of the following informalities:

Claim 1, line 1-2, "in particular for use in motor vehicles and especially" should be deleted.

Claim 11, line 3, "claims" should be corrected to read "claim 1".

Appropriate correction is required.

Specification

3. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to for being including legal phraseology such as "means". Correction is required. See MPEP 608.01(b).

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 10, 23, 32 and 42 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance:

Claim 10 recites the broad recitation "angle is between 10° and 180°", and the claim also recites "preferably between 45° and 135°, and particularly preferably between 80° and 100°" which is the narrower statement of the range/limitation;

Claim 23 recites the broad recitation "the discharge line is between 9:1", and the claim also recites "1:5, preferably between 5:1 and 1:1, and particularly

Art Unit: 3744

preferably is approximately 2:1" which is the narrower statement of the range/limitation;

Claim 32 recites the broad recitation "angle is between 10° and 180°", and the claim also recites "preferably between 45° and 135°, and particularly preferably between 80° and 100°" which is the narrower statement of the range/limitation;

Claim 42 recites the broad recitation "the bending angle amounts to 0°, 30°, 45°, 60°, 90°, 120° or 180°", and the claim also recites "any desired values in between" which is the narrower statement of the range/limitation;

Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1-31, 33-37, and 40-43 are rejected** under 35 U.S.C. 102(b) as being anticipated by Carlos (FR 2793013).

In regard to claim 1, Carlos teaches in Figures 1-7 an apparatus for heat exchange, for use in motor vehicle air conditioning systems (translated page 1, lines 1-4) which as refrigerant include a fluid with carbon dioxide (CO₂)

(translated page 6, lines 5-7), having a feed line (44) and discharge line (54), which open out into a distribution or collection space (30, 32), respectively, for a fluid, and at least one through-flow device (12), having at least one first end-side flow connection section (24), through which the fluid enters the through-flow device (12) or leaves the through-flow device (12), at least one second end-side flow connection section, through which the fluid leaves the through-flow device or enters the through-flow device (26), and the first flow connection section is flow-connected to the second flow connection section by at least one tube section (12), characterized in that at least one of the flow connection sections is twisted at least once (24), the first or second flow connection section is flow-connected to the collection space (32; Figure 1), the second or first flow connection section (24, 26) is flow-connected to the distribution space (30).

In regard to claims 2-5, Carlos teaches (Figures 1, 2 and 5) the tube (12, 56) section has at least one straight section; the tube section has at least one curved section (60); the tube section (12, 56) has at least one twisted section (Figure 2); the tube section (12, 56) has at least two curved sections with different radii of curvature (see Attachment 1, Fig. 5).

In regard to claim 6, Carlos teaches (Figure 1) that the number of first (24) and second flow connection sections (26) is equal to the number of tube sections (12).

In regard to claim 7, Carlos teaches (Figures 1,2 and 7) that the through-flow device (12, 56) has at least one flow passage (page 5, lines 41-43).

Art Unit: 3744

In regard to claim 8 Carlos teaches that the through-flow device is made of aluminum (page 3, lines 16-17).

In regard to claims 9-10, Carlos teaches that the first and/or second flow connection section (24, 26) is twisted over a predetermined angle (Figures 4-6); and that the magnitude of the twisting angle is between 10° and 180° (Figure 6);

In regard to claim 11, Carlos teaches that the two transition sections (58, 26, 60) are twisted in the same twisting direction (Figure 5).

In regard to claims 12, Carlos teaches that the two transition sections (24, 26) are twisted in opposite twisting directions (Figure 2).

In regard to claims 13-14, Carlos teaches that the tube section (56) is multiply twisted (Figure 4-6); that the tube section (56) is twisted at least twice in the same twisting direction (Figure 4-6).

In regard to claims 15-16, Carlos teaches that the tube section (56) is twisted at least twice in different twisting directions (Figures 4-6); the twisting angles of at least two twists of the tube section are substantially equal or equal in opposite directions.

In regard to claim 17, Carlos teaches that the twisted section of the tube section is connected to a supporting element (30, 32).

In regard to claim 18-19, Carlos teaches that a plurality of distribution/collection spaces (30, 32) which are thermally separated from one another (Figure 1, 4); and the thermal separation is effected by a plurality of distribution/collection spaces (30, 32) being spaced apart from one another (Figure 1, 4).

In regard to claim 20, Carlos teaches (Figure 4) that the thermal separation is effected by providing a material (34, 36) which promotes thermal separation between the distribution/collection spaces (30, 32).

In regard to claim 21, Carlos teaches (Figure 1) that the internal cross section of the receiving devices (24) substantially correspond to the external cross section of the through-flow device (12).

In regard to claim 22, Carlos teaches (Figure 2) that the receiving devices are substantially rectangular in form (24), and the longer side of these receiving devices is arranged at a predetermined angle with respect to the longitudinal direction of the distribution/collection device (30, 32; Figure 2).

In regard to claim 23, Carlos teaches that the magnitude of the angle of the through-flow device is between 0° and 90° (Figures 2, 3).

In regard to claim 24, Carlos teaches that the pluralities of through-flow devices (12; 56) are arranged substantially parallel to one another (Figures 1, 4; translated page 7, lines 12-14).

In regard to claim 25, Carlos teaches that cooling fins (14) are provided between the through-flow devices (12, 56).

In regard to claim 26, Carlos teaches (Figure 1, 7) tube sections (62, 64) of the through-flow devices (12, 56), and the supporting element ("connector"-66) are at least partially connected to one another non-positively.

In regard to claim 27, Carlos teaches (Figure 7) that frame devices (61; "two tablecloths) are provided and are at least partially connected to the

supporting element (66) and/or the collection/distribution space (30, 32; see translated page 5, lines 38-40).

In regard to claim 28, Carlos teaches (Figure 7) a separating device “beam”, page 5, lines 38-40) dividing the collection space (32; 62) and/or the distribution space (34; 64) into at least two space sections (the use of the device “beam” – not shown – is to divide the space as seen for the intended use. The beam of the collection space is capable of dividing any items).

In regard to claim 29, Carlos teaches (Figure 7) that two distribution and/or collection spaces are provided at least one separating device (“adjacent beam”; translated page 5, lines 38-40), dividing at least one of the two distribution and/or collection spaces into at least two space sections, and the two distribution and/or collection spaces are in flow connection via at least one through-flow device (12; the use of the beam to divide the space is seen as intended use. The adjacent beam of the collection spaces is capable of dividing any items).

In regard to claim 30, Carlos teaches that the feed line (44) and discharge line (54) are provided at one of the two collection and/or distribution spaces (30, 32),

In regard to claim 31, Carlos teaches that the feed line (44) and the discharge line (54) extend substantially in the longitudinal direction of the distribution or collection space (30, 32) at which they are arranged.

In regard to claim 32, Carlos teaches that the separating device (“beam”- translated page 5, lines 38-40) divides the distribution or collection

Art Unit: 3744

space in such a way that the ratio of the length of the section facing the feed line (30) to the length of the section facing the discharge line (32) is between is 1:1.

In regard to claim 33, Carlos teaches (Figure 7) that at least one space section (12) of the distribution space (30) is flow-connected to at least one space section (12) of the collection space by at least one connection device (66).

In regard to claim 34, Carlos teaches (Figure 7) that at least one space section of a first distribution/collection space is flow-connected to a further space section of a second distribution/collection space by at least one connecting device (66), the first distribution/collection space and the second distribution/collection space not lying on a straight line (translate page 5, lines 30-46).

In regard to claim 35, Carlos teaches (Figure 7) that the connection device (66) is provided in the region of the separating device and is preferably formed integrally with the separating device (translated page 5, lines 30-46) .

In regard to claim 36, Carlos teaches that a plurality of separating/connection devices (30, 32), which are preferably in single-part form, are provided and effect multiple diversions of the refrigerant (seen from Figure 7).

In regard to claim 37, Carlos teaches (Figure 10) that a distribution space (30), a collection space (32), a through-flow device (12) and a feed and discharge line (44, 54) are components which form a module (10).

In regard to claims 40-43, the device of Carlos having similar structure is produced in a similar manner.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. **Claims 38-39 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Carlos (FR 2793013) in view of Klass (US 3,602,295).

In regard to claim 38, Carlos discloses most of the claim limitations, however he does not explicitly teach an air flow control elements, a delivery device and a housing for heat exchanger.

Klass teaches air flow control elements (26, 27, 29), having air flow paths, at least one air delivery device (23; Figure 1) and a housing (9; Figure 1) which is suitable for receiving an apparatus for heat exchange (9).

It would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the system of Carlos with the system taught by Klass in order to improve the efficiency of a vehicle air conditioning system and the manufacturing process.

10. In regard to claim 39, Carlos discloses most of the claim limitations, however he does not explicitly teach a condenser, a compressor, an expansion valve and a collector.

Klass teaches a condenser (4), a compressor, an expansion valve (5), and a collector ("storage" - 8).

It would have been obvious to one having ordinary skill in the art at the time of invention was made to modify the system of Carlos with the system taught by Klass in order to improve the efficiency of a vehicle air conditioning system and the manufacturing process.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Memory et al. (US 2003/0183378) teach a heat exchanger and folded tube.
- Memory et al. (US 2003/0102113) teach a heat exchanger.
- Fink (US 3,416,600) teaches a heat exchanger having twisted multiple passage tubes.
- Hoshino et al. (US 5, 531, 268) teach a heat exchanger has flat tubes.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tatiana Delorm whose telephone number is

Art Unit: 3744

571-272-3421. The examiner can normally be reached on Monday through Friday from 9:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl Tyler can be reached on 571-272-4834, or Frantz Jules at 571-272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TMD

FRANTZ JULES
SUPERVISORY PATENT EXAMINER

A handwritten signature in black ink, appearing to read 'Frantz Jules', is written over a horizontal line.

FR: 2793013

Carlos - inventor. 1/3

Attachment #1

2793013

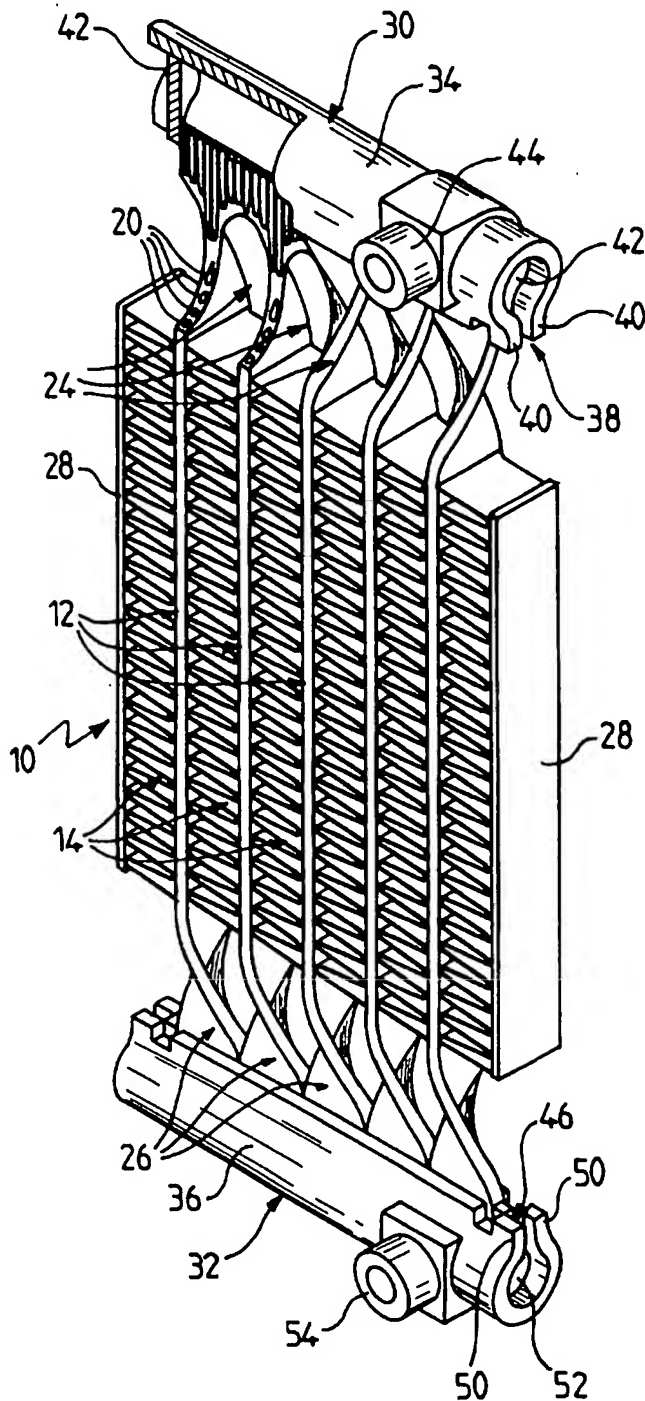


FIG.1

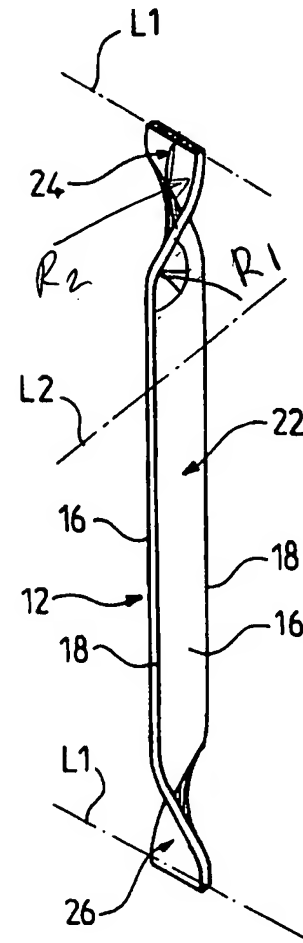


FIG.2

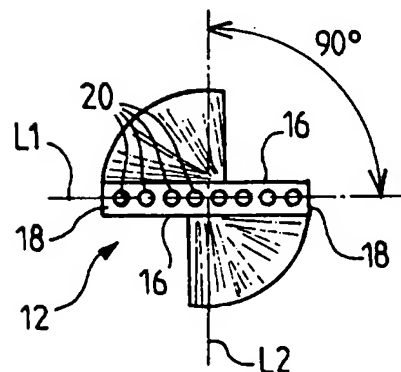


FIG.3